Complete Summary

GUIDELINE TITLE

Prevention and management of hip fracture in older people. A national clinical guideline.

BIBLIOGRAPHIC SOURCE(S)

Scottish Intercollegiate Guidelines Network (SIGN). Prevention and management of hip fracture in older people. A national clinical guideline. Edinburgh (Scotland): Scottish Intercollegiate Guidelines Network (SIGN); 2002 Jan. 40 p. (SIGN publication; no. 56). [183 references]

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

Hip fracture

GUIDELINE CATEGORY

Management
Prevention
Treatment

CLINICAL SPECIALTY

Emergency Medicine
Geriatrics
Internal Medicine
Nutrition
Orthopedic Surgery
Physical Medicine and Rehabilitation

INTENDED USERS

Advanced Practice Nurses
Dietitians
Nurses
Occupational Therapists
Physical Therapists
Physician Assistants
Physicians
Social Workers

GUIDELINE OBJECTIVE(S)

To present evidence-based recommendations for the prevention and management of hip fractures in older people

TARGET POPULATION

Older people in Scotland at risk for and with hip fracture

INTERVENTIONS AND PRACTICES CONSIDERED

Prevention

1. Identification of potentially reversible risk factors
2. Assessment of bone mass (measurement of bone mineral density)
3. Exercise and associated interventions, including home assessment, dietary change, use of hip protectors, education, cognitive intervention, or medication change
4. Drug therapies including calcium supplementation alone, calcium plus vitamin D, and bisphosphonates (e.g., alendronate, risedronate, etidronate) (Note: hormone replacement therapy is considered but not recommended)

Management

1. Admission intake
2. Transfer to hospital
3. Prevention of pressure sores with foam based low-pressure mattress or similar pressure-decreasing measures
4. Diagnosis using plain radiographs, radioisotope bone scan, and magnetic resonance imaging
5. Pain relief including titration of intravenous opiates and local nerve block

Preoperative Care

1. Preoperative traction (either skin or skeletal) (considered but not recommended)
2. Antibiotic prophylaxis
3. Antithrombotic prophylaxis including mechanical prophylaxis (intermittent pneumatic compression, foot pumps, or graduated elastic compression

stockings), antiplatelet drugs (aspirin), heparins, and oral anticoagulants and dextrans
4. Correction of fluid and electrolyte imbalances, if applicable
5. Supplementary oxygen

Anaesthetic management

1. General and regional anaesthesia
2. Peripheral nerve blocks
3. Invasive intravascular monitoring

Surgical Management

1. Surgical treatment of intracapsular fractures including internal fixation, total hip replacement, or hemiarthroplasty (unipolar and bipolar) with use of bone cement
2. Surgical treatment of extracapsular fractures including extramedullary and intramedullary fixation/implants, osteotomy, and compression

Early Postoperative Management

Postoperative management including pain relief, oxygen saturation monitoring and oxygen supplementation, fluid and electrolyte management, early mobilization, prevention of constipation, and urinary catheterization

Rehabilitation and Discharge

Rehabilitation and discharge including early assessment, possible admission to a Geriatric Orthopaedic Rehabilitation Unit (GORU), diet supplementation, and multidisciplinary rehabilitation and discharge

MAJOR OUTCOMES CONSIDERED

- Hip fractures rates and risk
- Bone loss
- Morbidity associated with hip fracture and surgery (pressure sores, deep vein thrombosis, pulmonary embolism, infection, venous thromboembolism)
- Mortality
- Pain relief
- Length of hospital stay
- Quality of life

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

A systematic review of the literature was carried out using an explicit search strategy devised by the Scottish Intercollegiate Guidelines Network (SIGN) Information Officer in collaboration with members of the guideline development group. Searches were restricted to systematic reviews, meta-analyses, and randomised controlled trials. Material relating to people aged under 45 years and fractures caused by other diseases (e.g. cancer) were specifically excluded. Internet searches were carried out on the Web sites of the Canadian Practice Guidelines Infobase, the New Zealand Guidelines Programme, the UK Health Technology Assessment programme, and the US National Guidelines Clearinghouse. Searches were also carried out on the search engines Northern Light and OMNI, and all suitable links followed up. Database searches were carried out on Cochrane Library, ASSIA, CINAHL, Embase, Healthstar, Medline, PsychInfo, and Sociological Abstracts from 1985-1999. Separate searches were carried out for subgroups of the main development group looking at acute care, physiotherapy, postoperative care, and prevention of falls. The Medline version of the main search strategies can be found on the Scottish Intercollegiate Guidelines Network web site, in the section covering supplementary guideline material. The main searches were supplemented by material identified by individual members of the development group. All selected papers were evaluated using standard methodological checklists before conclusions were considered as evidence.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Levels of Evidence

1++ - High quality meta-analyses, systematic reviews of randomized controlled trials (RCTs), or RCTs with a very low risk of bias

1+ - Well-conducted meta-analyses, systematic reviews, or RCTs with a low risk of bias

1- - Meta-analyses, systematic reviews, or RCTs with a high risk of bias

2++ - High quality systematic reviews of case control or cohort studies. High quality case control or cohort studies with a very low risk of confounding or bias and a high probability that the relationship is causal

2+ - Well-conducted case control or cohort studies with a low risk of confounding or bias and a moderate probability that the relationship is causal

2- - Case control or cohort studies with a high risk of confounding or bias and a significant risk that the relationship is not causal

3 – Non-analytic studies, e.g., case reports, case series

4 – Expert opinion

METHODS USED TO ANALYZE THE EVIDENCE

Review of Published Meta-Analyses
Systematic Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

The Scottish Intercollegiate Guidelines Network (SIGN) carries out comprehensive systematic reviews of the literature using customized search strategies applied to a number of electronic databases and the Internet. This is often an iterative process whereby the guideline development group will carry out a search for existing guidelines and systematic reviews in the first instance and, after the results of this search have been evaluated, the questions driving the search may be redefined and focused before proceeding to identify lower levels of evidence.

Once papers have been selected as potential sources of evidence, the methodology used in each study is assessed to ensure its validity. SIGN has developed checklists to aid guideline developers to critically evaluate the methodology of different types of study design. The result of this assessment will affect the level of evidence allocated to the paper, which in turn will influence the grade of recommendation it supports.

Additional details can be found in the companion document: SIGN 50: A guideline developer's handbook. Edinburgh (Scotland): Scottish Intercollegiate Guidelines Network, 2001 Feb. (SIGN publication; no. 50). Available from the SIGN Web site.

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

The process for synthesizing the evidence base to form graded guideline recommendations is illustrated in the companion document titled "SIGN 50: A Guideline Developer's Handbook." (Edinburgh [UK]: Scottish Intercollegiate Guidelines Network. [SIGN publication; no. 50], available from the SIGN website.

Evidence tables should be compiled, summarizing all the validated studies identified from the systematic literature review relating to each key question. These evidence tables form an important part of the guideline development record and ensure that the basis of the guideline development group's recommendations is transparent.

In order to address how the guideline developer was able to arrive at their recommendations given the evidence they had to base them on, SIGN has introduced the concept of considered judgement.

Under the heading of considered judgement, guideline development groups are expected to summarise their view of the total body of evidence covered by each evidence table. This summary view is expected to cover the following aspects:

- Quantity, quality, and consistency of evidence
- Generalisability of study findings
- Applicability to the target population of the guideline
- Clinical impact (i.e., the extent of the impact on the target patient population, and the resources need to treat them.)

Guideline development groups are provided with a pro forma in which to record the main points from their considered judgement. Once they have considered these issues, the group are asked to summarise their view of the evidence and assign a level of evidence to it, before going on to derive a graded recommendation.

The assignment of a level of evidence should involve all those on a particular guideline development group or subgroup involved with reviewing the evidence in relation to each specific question. The allocation of the associated grade of recommendation should involve participation of all members of the guideline development group. Where the guideline development group is unable to agree a unanimous recommendation, the difference of opinion should be formally recorded and the reason for dissent noted.

The recommendation grading system is intended to place greater weight on the quality of the evidence supporting each recommendation, and to emphasise that the body of evidence should be considered as a whole, and not rely on a single study to support each recommendation. It is also intended to allow more weight to be given to recommendations supported by good quality observational studies where randomised controlled trials (RCTs) are not available for practical or ethical reasons. Through the considered judgement process guideline developers are also able to downgrade a recommendation where they think the evidence is not generalisable, not directly applicable to the target population, or for other reasons is perceived as being weaker than a simple evaluation of the methodology would suggest.

On occasion, there is an important practical point that the guideline developer may wish to emphasise but for which there is not, nor is their likely to be, any research evidence. This will typically be where some aspect of treatment is regarded as such sound clinical practice that nobody is likely to question it. These are marked in the guideline as "good practice points." It must be emphasized that these are not an alternative to evidence-based recommendations, and should only be used where there is no alternative means of highlighting the issue.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

The grade of recommendation relates to the strength of the evidence on which the recommendation is based. It does not reflect the clinical importance of the recommendation.

Grade A: At least one meta-analysis, systematic review of randomized controlled trials (RCTs), or randomized controlled trial rated as 1++ and directly applicable to the target population; or

A body of evidence consisting principally of studies rated as 1+, directly applicable to the target population, and demonstrating overall consistency of results

Grade B: A body of evidence including studies rated as 2++, directly applicable to the target population, and demonstrating overall consistency of results; or

Extrapolated evidence from studies rated as 1++ or 1+

Grade C: A body of evidence including studies rated as 2+, directly applicable to the target population and demonstrating overall consistency of results; or

Extrapolated evidence from studies rate as 2++

Grade D: Evidence level 3 or 4; or

Extrapolated evidence from studies rated as 2+

Good Practice Points: Recommended best practice based on the clinical experience of the guideline development group.

COST ANALYSIS

Cost-effective Targeting of Interventions

Modification of environmental risk factors, use of hormone replacement therapy (HRT) and treatment with calcium and vitamin D targeted at those with relevant risk factors all may result in reductions in hip fracture rates. The costs associated with these interventions are lower in the longer term compared to the cost of no treatment to reduce risk and the cost of managing a later hip fracture. However, some sustained treatments (e.g. hormone replacement therapy) may be less clinically desirable and should be assessed for each patient and related to lifestyle issues.

The quality of the cost-effectiveness evidence for some interventions is relatively poor (e.g. modification of environmental risk factors, hormone replacement therapy and vitamin D).

The most cost-effective intervention is calcium and vitamin D. The more costly bisphosphonates start to become cost-effective when their use is targeted to high risk individuals (see sections 2.1 and 2.2 of the original guideline document).

Targeting therapy to high risk individuals - by using either bone mineral density (BMD) measurement or an assessment of clinical risk factors for bone related risk factors during routine visits - greatly improves the cost-effectiveness of hip fracture prevention. Targeting those with low bone mineral density gives a cost per hip fracture prevented of approximately £11,000 for bisphosphonates (excluding cost savings from avoiding treatment). The cost per hip fracture

prevented and the total cost to the health service are even more favourable for calcium and vitamin D, and hip protectors.

BMD measurement appears to be a less cost-effective method of targeting therapy with calcium and vitamin D than assessing clinical risk factors. However, it may be the only realistic way to target the use of bisphosphonates to reduce hip fractures.

Additional information about the cost-effectiveness of interventions to prevent falls and hip fractures is available on the Scottish Intercollegiate Guidelines Network (SIGN).

METHOD OF GUIDELINE VALIDATION

External Peer Review
Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

A national open meeting is the main consultative phase of the Scottish Intercollegiate Guidelines Network (SIGN) guideline development, at which the guideline development group presents their draft recommendations for the first time. The national open meeting for this guideline was held in conjunction with the Hipfest meetings in 1999 and 2001. The draft guideline was also available on the SIGN web site for a limited period at this stage to allow those unable to attend the meeting to contribute to the development of the guideline.

The guideline was also reviewed in draft form by a panel of independent expert referees, who were asked to comment primarily on the comprehensiveness and accuracy of interpretation of the evidence base supporting the recommendations in the guideline.

As a final quality control check, the guideline was reviewed by an Editorial Group comprising the relevant specialty representatives on SIGN Council.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Note from the Scottish Intercollegiate Guidelines Network (SIGN) and National Guideline Clearinghouse (NGC): In addition to these evidence-based recommendations, the guideline development group also identifies points of best clinical practice in the full-text guideline document.

The grades of recommendations (A-D) and levels of evidence (1++, 1+, 1-, 2++, 2+, 2-, 3, 4) are defined at the end of the "Major Recommendations" field.

Prevention

A – Assess the risk of hip fracture in older people using the identified risk indicators and base any intervention on this risk assessment (patient and environment).

A – Older people should have their risk of falls and fracture assessed.

A – Those at increased risk should be offered multiple interventions (e.g., exercise programmes focused on strength, flexibility, and which are weight-bearing; balance training; and modification of identified hazards) aimed at reducing the identified individual and environmental risks.

B – Hip protectors are recommended in men and women at high risk of hip fracture, particularly older people in care homes, although problems with compliance should be recognised.

B – Assessment of recognised risk factors for low bone density is the most cost-effective method of targeting interventions that act on low bone density. Mass screening for low bone mineral density is less cost-effective and is not recommended.

B – All patients who are assessed as being at risk of hip fracture should be treated with calcium and vitamin D.

A – All patients who are assessed as being at high risk of hip fracture should be treated with:

- hip protectors, when patients are living in a care home setting and are assessed as being compliant

  or

- the bisphosphonates, alendronate or risedronate, when risk is assessed by measuring bone mineral density.

Pre-hospital Management

D – When a patient is admitted all of the essential information fields in the Scottish Intercollegiate Guidelines Network referral document should be recorded, in particular:

- history and examination findings
- concurrent medical condition and relevant past medical history
- current drug therapy
- premorbid functional state, particularly mobility
- premorbid cognitive function
- social circumstances.

Management in Accident & Emergency

D – Early assessment, in accident & emergency or on the ward, should include a formal recording of:

- pressure sore risk
- hydration and nutrition
- fluid balance
- pain
- core body temperature using a low reading thermometer
- continence
- co-existing medical problems
- mental state
- previous mobility
- previous functional ability
- social circumstances

B – Patients judged to be at very high risk of pressure sores should ideally be nursed on a large-cell, alternating-pressure air mattress or similar pressure-decreasing surface.

D – Patients admitted to accident & emergency with a suspected hip fracture should be managed as follows:

- use soft surfaces to protect the heel and sacrum from pressure damage
- keep the patient warm
- administer pain relief to allow for regular, comfortable change of patient position
- instigate early radiology
- measure and correct any fluid and electrolyte abnormalities

D – Patients should be transferred to the ward within two hours of their arrival in accident & emergency.

D – Magnetic resonance (MR) imaging is the investigation of choice where there is doubt regarding the diagnosis. If magnetic resonance is not available or not feasible, a radioisotope bone scan or repeat plain radiographs (after a delay of 24-48 hours) should be performed.

D – Adequate and appropriate pain relief should be administered before the patient is transferred from a trolley to the x-ray table.

Preoperative Care

C – Patients should be operated on as soon as possible (within 24 hours), during standard daytime working hours, including weekends, if their medical conditions allows.

A – The routine use of traction (either skin or skeletal) does not appear to have any benefit and is not recommended prior to surgery for a hip fracture.

A – All patients undergoing hip fracture surgery should receive antibiotic prophylaxis.

A – Mechanical prophylaxis (intermittent pneumatic compression or foot pumps) should be considered to reduce the risk of asymptomatic deep vein thrombosis

(DVT) after hip fracture. There is no evidence for efficacy of graduated elastic compression stockings in hip fracture patients.

A – All patients with hip fracture should receive aspirin (150 mg orally, started on admission and continued for 35 days) unless contraindicated.

A – Heparin should be reserved for selected patients at high risk of venous thromboembolism after hip fracture due to:

- multiple risk factors (more than one of the following: age > 80 years, obesity [body mass index > 30 kg/m^2], varicose veins, previous venous thromboembolism, thrombophilias, heart failure, recent myocardial infarction or stroke, severe infection, inflammatory bowel disease, nephrotic syndrome, polycthaemia, paraproteinaemia, Bechet´s disease, paroxysmal nocturnal haemoglobinuria, hormone replacement therapy, tamoxifen, paralysis, malignancy.)
- contraindications to routine mechanical prophylaxis and/or aspirin.

D – Patients should have clinical and laboratory assessment of possible hypovolaemia and electrolyte balance, and deficiencies appropriately and promptly corrected.

C – Oxygen saturation should be checked on admission. Supplementary oxygen should be administered to all patients with hypoxemia.

Anaesthetic Management

D – Anaesthesia should be carried out, or closely supervised, by an anaesthesist with sufficient experience of anaesthesia in elderly patients.

B – Regional anaesthesia is recommended for patients undergoing hip fracture repair, providing there are no specific indications for general anaesthesia or contraindications to regional anaesthesia.

Surgical Management

D – Most undisplaced intracapsular hip fractures that are treated surgically should have internal fixation, except in the very elderly, when hemiarthroplasty may be considered.

B – Assessment prior to surgery must considered the patient´s:

- Age
- Mobility
- Mental state
- Pre-existing bone and joint pathology

B – Younger, active, fit patients should be considered for internal fixation

B – Active patients with an anticipated survival of more than a few years should be considered for internal fixation, total hip replacement or hemiarthroplasty, depending on the patient factors outlined above.

B – Patients with an anticipated survival of less than three years and patients whose activity level is low should be considered for hemiarthroplasty.

B – Bed or chair bound patients may be treated conservatively.

C – Cement should be used when undertaking hemiarthroplasty, unless there are cardiorespiratory complications.

B – Bipolar hemiarthroplasty should not be performed in preference to unipolar hemiarthroplasty, as there is limited evidence of any clinical benefit.

C – The anterolateral approach is recommended for hemiarthroplasty.

D – In patients with pre-existing joint disease, medium/high activity levels and a reasonable life expectancy, total hip replacement may be appropriate as the primary treatment.

B – Extracapsular hip fractures should all be treated surgically unless there are medical contraindications.

Early Postoperative Management

D – Regular assessment and formal charting of pain scores should be adopted as routine practice in postoperative care.

B – Oxygen saturation should be monitored routinely to reduce the incidence of hypoxaemia and continued for as long as the tendency to hypoxaemia exists.

C – Supplementary oxygen is recommended for at least six hours after general or spinal/epidural anaesthesia, at night for 48 hours postoperatively and for as long as hypoxaemia persists as determined by pulse oximetry.

B – Fluid and electrolyte management in elderly patients should be monitored regularly.

D – Fluid and electrolyte management should begin in accident & emergency.

Rehabilitation and Discharge

B – Within 48 hours of admission, a corroborated history should be obtained, which should include:

- Premorbid function and mobility
- Available social support
- Current relevant clinical conditions
- Mental state

B – Patients with co-morbidity, poor functional ability and low mental test scores prior to admission should undergo rehabilitation in a Geriatric Orthopaedic Rehabilitation Unit.

A – Supplementing the diet of hip fracture patients in rehabilitation with high energy protein preparations containing minerals and vitamins should be considered.

B – Multidisciplinary team working facilitates the rehabilitation process.

B – Supported discharge schemes should be used to facilitate the date discharge of elderly hip fracture patients and reduce acute hospital stay.

Definitions:

Grades of Recommendations

A – At least one meta-analysis, systematic review, or randomized controlled trial (RCT) rated as 1++, and directly applicable to the target population.

A body of evidence including studies consisting principally of studies rated as 1+, directly applicable to the target population, and demonstrating overall consistency of results.

B – A body of evidence including studies rated as 2++, directly applicable to the target population, and demonstrating overall consistency of results.

Extrapolated evidence from studies rated as 1++ or 1+

C – A body of evidence including studies rated as 2+, directly applicable to the target population and demonstrating overall consistency of results

Extrapolated evidence from studies rated as 2++

D – Evidence level 3 or 4

Extrapolated evidence from studies rated as 2+

Levels of Evidence

1++ – High quality meta-analyses, systematic reviews of RCTs, or RCTs with a very low risk of bias

1+ – Well-conducted meta-analyses, systematic reviews, or RCTs with a low risk of bias

1- – Meta-analyses, systematic reviews, or RCTs with a high risk of bias

2++ – High quality systematic reviews of case control or cohort studies. High quality case control or cohort studies with a very low risk of confounding or bias and a high probability that the relationship is causal

2+ – Well-conducted case control or cohort studies with a low risk of confounding or bias and a moderate probability that the relationship is causal

2- – Case control or cohort studies with a high risk of confounding or bias and a significant risk that the relationship is not causal

3 – Non-analytic studies, e.g., case reports, case series

4 – Expert opinion

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is identified and graded for each recommendation (see "Major Recommendations").

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Prevention of Hip Fractures

- A recent systematic review of seven randomized controlled trials has found that hip protectors worn by older people in institutional settings who are at high risk of hip fracture appear to reduce the risk of fracture by 50-66%.
- The risk of hip fracture may be reduced by a number of dietary and pharmacological agents that decrease bone turnover and reduce fracture incidence.
- One randomized controlled trial showed no benefit of calcium supplementation on bone loss during the first five years postmenopause, but supplementation produced a significant increase in bone mineral density at the hip in the late menopause.
- Calcium plus vitamin D has been shown to reduce significantly the incidence of all fractures, including hip, in both elderly women with a high risk of hip fracture living in institutions and in independently living men and women over 65 years of age.
- There are randomized controlled trials on the use of the alendronate in both primary and secondary prevention. These trials, on women with and without pre-existing vertebral fractures, showed a statistically significant reduction in hip fractures over three years of treatment but contained only small numbers of fractures in a highly selected group of women. Both trials showed

statistically significant increases in bone density at hip sites with duration of treatment.

Perioperative Management of Hip Fractures

- Use of foam based low-pressure mattress, rather than a standard hospital mattress, has been shown to reduce the occurrence of pressure sores.
- Early surgery (within 24 hours) reduces the risk of deep vein thrombosis (DVT) and of fatal pulmonary embolism (PE) after hip fracture.
- A systematic review of randomised trials indicates that the administration of antibiotic prophylaxis in patients undergoing surgery for a hip fracture is associated with a reduced incidence of superficial and deep wound infection, urinary tract infection and respiratory infection.
- A meta-analysis of four randomised controlled trials involving 422 patients of mechanical methods (two trials of intermittent pneumatic compression (IPC) and two of foot pumps; no trials of graduated elastic compression stockings (GECS) were identified) observed that the incidence of asymptomatic deep vein thrombosis was reduced from 19% to 6% (NNT=7.2).
- A meta-analysis of randomised controlled trials (mainly the pulmonary embolism prevention study of aspirin) in patients undergoing surgery for hip fracture observed that aspirin reduced the risk of asymptomatic deep vein thrombosis (42% to 36%), symptomatic deep vein thrombosis (1.5% to 1.0%), all pulmonary embolism (1.6% to 0.8%) and fatal pulmonary embolism (0.8% to 0.4%), with no effect on total mortality.
- A meta-analysis of unfractionated heparin (UFH) and low molecular weight heparin (LMWH) in hip fracture surgery showed that heparins reduced the risk of asymptomatic deep vein thrombosis from 39 to 24% (NNT=6.5).
- Oral anticoagulants and dextrans reduce the risk of venous thromboembolism after surgery.
- Patient outcomes are better when perioperative management is undertaken by experienced anaesthetic personnel.
- In patients who have undergone regional anaesthesia there may be a reduction in mortality at one month, and there appear to be other benefits from regional rather than general anaesthesia, including a significant reduction in the incidence of deep venous thrombosis.

A small study of patients undergoing general anaesthesia found the use of an oesophageal Doppler monitor to optimise the intravascular volume status of patients was associated with a more rapid recovery postoperatively and reduced length of stay.

Surgical Treatment of Hip Fractures and Postoperative Care

- Although there is no association between the grade of surgeon and mortality, the duration of surgery and incidence of postoperative complications are reduced and outcomes improved with an experienced surgeon.
- The limited evidence available suggests that there is little difference in outcome between operation and conservative treatment of undisplaced fractures. However, surgical treatment allows early mobilisation of the patient and reduces the risk of untreated undisplaced fractures becoming displaced at a later date. Undisplaced intracapsular fractures that are treated surgically should be treated by internal fixation.

- The provision of good pain relief for postoperative patients is generally associated with reduced cardiovascular, respiratory and gastrointestinal morbidity. Good analgesia is thought to enhance early mobilisation and may be associated with early discharge from hospital.
- Early mobilisation may prevent complications such as pressure damage and deep vein thrombosis. Early mobilisation in combination with pre- and postoperative physiotherapy may be of value in reducing pulmonary complications.
- Oral multinutrient feeds provide protein, energy, some vitamins and minerals and may reduce complications whilst in hospital, although they have no effect on mortality. The presence of protein in an oral feed may reduce the number of days spent in rehabilitation.
- The benefits of shared postoperative management by orthopaedic surgeons and geriatricians include trends towards earlier functional independence, reduced length of stay, improved management of medical conditions and decreased future need for institutional care, including nursing home care.
- Supported discharge schemes have also been shown to improve patients' abilities to carry out activities of daily living and increase the overall proportion of patients discharged home.
- Supported discharge and hospital at home schemes reduce length of acute stay and appear to free resources without transferring unacceptable costs to community health and social services.
- Multidisciplinary discharge management, involving community and hospital nurses, hospital doctors and general practitioners, physiotherapists, occupational therapists, social workers and family has been shown to improve planning and implementation of discharging patients.

Subgroups Most Likely to Benefit:

Individuals at highest risk for hip fracture, including the following groups:

- Individuals with low trauma fracture after the age of 50 years
- Individuals with a maternal history of hip fracture
- Current smokers
- Individuals with a low body weight (body mass index < 18.5)

POTENTIAL HARMS

- Compliance with wearing hip protectors in older people living in care homes is likely to be only 25-30%, mainly due to problems with fit and skin irritation.
- A meta-analysis of randomized controlled trials in patients undergoing surgery for hip fractures observed that the excess risk of bleeding was small with use aspirin (one additional transfused bleed per 1,000 patients who were not receiving concomitant heparin prophylaxis).
- Oral anticoagulants and dextrans carry the risks of bleeding (oral anticoagulants) and anaphylaxis (dextrans).
- The use of regional anaesthesia in patients who have received unfractionated low dose heparin (LDH) and low molecular weight heparin (LMWH) is controversial because of the risk of development of a vertebral canal haematoma.

- The use of bone cement has been associated with intra-operative morbidity. Uncemented stems are associated with more thigh pain and poorer overall function.
- Complications from internal fixation may require reoperation (reported reoperation rates range from 17-36%).
- Dislocation and thrombosis are more common with the posterior approach for hemiarthroplasty, but increased operative time, blood loss and infection are more common with the anterior approach of hemiarthroplasty.
- Dislocation rates of between 10-20% can be expected with total hip replacement.

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

This guideline is not intended to be construed or to serve as a standard of patient care. Standards of care are determined on the basis of all clinical data available for an individual case and are subject to change as scientific knowledge and technology advance and patterns of care evolve. The ultimate judgement regarding a particular clinical procedure or treatment plan must be made in light of the clinical data presented by the patient and the diagnostic and treatment options available. However, it is advised that significant departures from the national guideline or any local guidelines derived from it should be fully documented in the patient's case notes at the time the relevant decision is taken.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

In general terms, implementation of national clinical guidelines is the responsibility of each National Health Service (NHS) Trust and is an essential part of clinical governance. It is acknowledged that every Trust cannot implement every guideline immediately on publication, but mechanisms should be in place to ensure that the care provided is reviewed against the guideline recommendations and the reasons for any differences assessed and, where appropriate, addressed. These discussions should involve both clinical staff and management. Local arrangements may then be made to implement the national guideline in individual hospitals, units and practices, and to monitor compliance. This may be done by a variety of means including patient-specific reminders, continuing education and training, and clinical audit. Integrated Care Pathways may be a useful means by which to implement the guideline at the "bedside".

Key points of audit and recommendations for further research are identified in the original guidelines. Scotland has both a national guideline for hip fracture care and national hip fracture audit on a substantial scale. This offers unique opportunities to use audit and the guideline together to document care, compare the care delivered with that recommended, and then match care more closely to recommendations by clinical and organisational initiatives undertaken and evaluated locally. This approach, applicable to the whole journey of care, has delivered measurable local improvements in specific aspects of care and the

organisation of care, and continues to offer examples of evaluated initiatives that other services can learn from.

Please see the Implementation and Audit section of the original guideline document for further details.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Staying Healthy

IOM DOMAIN

Effectiveness
Patient-centeredness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Scottish Intercollegiate Guidelines Network (SIGN). Prevention and management of hip fracture in older people. A national clinical guideline. Edinburgh (Scotland): Scottish Intercollegiate Guidelines Network (SIGN); 2002 Jan. 40 p. (SIGN publication; no. 56). [183 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2002 Jan

GUIDELINE DEVELOPER(S)

Scottish Intercollegiate Guidelines Network - National Government Agency [Non-U.S.]

SOURCE(S) OF FUNDING

Scottish Executive Health Department

GUIDELINE COMMITTEE

Not stated

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Guideline Development Group: Dr Colin Currie (Joint Chairman); Professor James Hutchison (Joint Chairman); Mrs Winifred Boyd; Mrs Joyce Brown; Professor Charles Court-Brown; Dr Kerr Fraser; Mrs Norma Goodfellow; Mr Robin Harbour; Dr James Leask; Dr Claire Martindale; Dr John Mckay; Dr Traven McLintock; Ms Lynne Morgan; Dr Rod Muir; Dr Safia Qureshi; Professor David Reid; Dr Richard Scorgie; Dr Sue Shepherd; Mr James Stevenson; Ms Lisa Stewart; Mr Ian Stother; Mr Luke Vale

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

All members of the Scottish Intercollegiate Guidelines Network (SIGN) guideline development groups are required to complete a declaration of interests, both personal and non-personal. A personal interest involves payment to the individual concerned, e.g., consultancies or other fee-paid work commissioned by or shareholdings in the pharmaceutical industry; a non-personal interest involves payment which benefits any group, unit or department for which the individual is responsible, e.g., endowed fellowships or other pharmaceutical industry support. SIGN guideline group members should be able to act as independently of external commercial influences as possible, therefore, individuals who declare considerable personal interests may be asked to withdraw from the group. Details of the declarations of interest of any guideline development group member(s) are available from the SIGN executive.

GUIDELINE STATUS

This is the current release of the guideline.

Any amendments to the guideline in the interim period will be noted on the Scottish Intercollegiate Guidelines Network (SIGN) Web site.

GUIDELINE AVAILABILITY

Electronic copies: Available from the Scottish Intercollegiate Guidelines Network (SIGN) Web site:

- HTML Format
- Portable Document Format (PDF)

AVAILABILITY OF COMPANION DOCUMENTS

The following is available:

- Supporting material. Cost-effectiveness of methods to prevent hip fractures, Scottish Intercollegiate Guidelines Network, 2002. Electronic copies available from the Scottish Intercollegiate Guidelines Network (SIGN) Web site.
- Quick reference guide: Prevention and management of hip fracture in older people, Scottish Intercollegiate Guidelines Network, 2002. 2 p. Electronic copies available in Portable Document Format (PDF) from the SIGN Web site.

- SIGN 50: A guideline developer's handbook. Edinburgh (Scotland): Scottish Intercollegiate Guidelines Network, 2001 Feb. (SIGN publication; no. 50). Electronic copies available from the SIGN Web site.
- Appraising the quality of clinical guidelines. The SIGN guide to the AGREE (Appraisal of Guidelines Research & Evaluation) guideline appraisal instrument. Edinburgh (Scotland): Electronic copies a from the, SIGN Web site.
- A background paper on the legal implications of guidelines. Edinburgh (Scotland): Scottish Intercollegiate Guidelines Network.

PATIENT RESOURCES

The following is available:

- Key messages for patients. In: Prevention and management of hip fracture in older people. Edinburgh (Scotland): Scottish Intercollegiate Guidelines Network, 2002 Jan. pp. 34. (SIGN publication; no. 56).

Electronic copies: Available from the Scottish Intercollegiate Guidelines Network (SIGN) Web site:

- HTML format
- Portable Document Format (PDF)

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

NGC STATUS

This NGC summary was completed by ECRI on September 30, 2002. The information was verified by the guideline developer on October 28, 2002.

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